

AD-A213 451

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188

1a REPORT SECURITY CLASSIFICATION U		1b RESTRICTIVE MARKINGS NA	
2a SECURITY CLASSIFICATION AUTHORITY NA		3 DISTRIBUTION / AVAILABILITY OF REPORT Distribution Unlimited	
2b DECLASSIFICATION / DOWNGRADING SCHEDULE NA		5 MONITORING ORGANIZATION REPORT NUMBER(S) NA	
4 PERFORMING ORGANIZATION REPORT NUMBER(S) Harvard University		7a NAME OF MONITORING ORGANIZATION Office of Naval Research	
6a NAME OF PERFORMING ORGANIZATION Harvard University		6b OFFICE SYMBOL (If applicable) NA	
6c ADDRESS (City, State, and ZIP Code) Cambridge, MA 02138		7b ADDRESS (City, State, and ZIP Code) 800 N. Quincy Street Arlington, VA 22217-5000	
8a NAME OF FUNDING / SPONSORING ORGANIZATION Office of Naval Research		9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER N00014-88-K-0038	
8b OFFICE SYMBOL (If applicable) ONR		10 SOURCE OF FUNDING NUMBERS	
8c ADDRESS (City, State, and ZIP Code) 800 N. Quincy Street Arlington, VA 22217-5000		PROGRAM ELEMENT NO 61153N	PROJECT NO RR04108
		TASK NO 442d006	WORK UNIT ACCESSION NO
1 TITLE (Include Security Classification) Progress Report			
12 PERSONAL AUTHOR(S) Jerome Kagan			
13a TYPE OF REPORT Annual		13b TIME COVERED FROM 6/88 TO 6/89	
		14 DATE OF REPORT (Year, Month, Day) 1989, October 11	
		15 PAGE COUNT one	
16 SUPPLEMENTARY NOTATION NA			
17 COSATI CODES		18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB-GROUP	
08			
		allergy, anxiety, temperament, health	
19 ABSTRACT (Continue on reverse if necessary and identify by block number) Interviews were conducted with 252 first and second degree relatives of children who had been selected in the second or third year of life as extremely inhibited or uninhibited in their temperamental classification. In addition, interviews were conducted with a group of 95 relatives of children who did not belong to either temperamental group. The most robust result was the occurrence of a significantly higher frequency of reports of hay fever in the relatives of inhibited children (32 percent versus 20 percent, $p < .01$). Additionally, more relatives of inhibited children reported having chronic constipation (14 percent versus 6 percent). Finally self reports of shyness both in adulthood and childhood were more frequent in the relatives of inhibited than the relatives of uninhibited children. Further, the shy adults were more likely to report suffering from asthma, headaches, or constipation.			
20 DISTRIBUTION AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS		21 ABSTRACT SECURITY CLASSIFICATION U	
22a NAME OF RESPONSIBLE INDIVIDUAL Dr. A. J. Majde		22b TELEPHONE (Include Area Code) (202) 696-4055	
		22c OFFICE SYMBOL ONR	

DD Form 1473, JUN 86

Previous editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE

S/N 0102-LF-014-6603

89 10 16 120

In addition, interviews were conducted with 478 first and second degree relatives of 100 infants who belong to a volunteer sample and are being seen in our laboratory at 2, 4, 9, 14, and 21 months for evaluations of signs of limbic arousal and precursors of inhibited and uninhibited behavior in the second year. The data from this sample are in accord with those from the primary sample. There was a higher frequency of respiratory allergies and migraine headaches in the relatives of infants who showed both high limbic arousal at 4 months of age and high fearfulness in the second year of life.

Accession For	
NTIS CRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution	
Availability Codes	
Dist	Availability Codes
A-1	

Progress Report (Year 1)

Office of Naval Research Contract

N00014-88-K-0038

October 31, 1988 - October 31, 1989

I. Background

Research conducted in many laboratories, including our own, indicates that two salient and stable temperamental categories in children refer to the person's initial behavioral reaction to unfamiliar situations and mild challenge. It is estimated that about 10 percent of children consistently display an initial tendency toward withdrawal and emotional restraint to unfamiliar people, situations, or objects while about 15-20 percent show the complementary characteristics of approach and emotional spontaneity in the same unfamiliar settings. We call the former group of children inhibited and the latter group uninhibited (Kagan, Reznick, & Snidman, 1988; Kagan et al., 1984; Kagan, 1989).

Over the past twelve years we have documented, first, that these two behavioral styles are preserved from early childhood to the eighth year of life in two independent samples of Caucasian children selected to be inhibited or uninhibited in the second or third year of life. About 50 percent of the inhibited children remained moderately shy and emotionally subdued when they were of school age while about three-quarters of uninhibited children remained spontaneous and sociable. In addition, significantly

more of the inhibited, compared with the uninhibited, children manifest peripheral physiological signs of limbic arousal, especially in the amygdala and the hypothalamus and their projections to the sympathetic chain, pituitary-adrenal axis, and the midbrain skeletal motor centers. Specifically, inhibited children consistently show an acceleration of heart rate as well as low heart rate variability and larger pupillary dilations to cognitive challenge; higher levels of salivary cortisol, and greater muscle tension. An aggregate index across these multiple physiological indexes gathered at 5 1/2 years of age was highly correlated with inhibited behavior at every age of assessment from 21 months to 7 1/2 years (Kagan, Reznick, & Snidman, 1987).

In addition, some investigators have reported heritability of these two psychological categories in children (Plomin & Rowe, 1979) while others have reported heritability of introversion and extraversion in adults (Scarr & Kidd, 1983). We believe that a large proportion of adult introverts were inhibited children and a proportion of extroverts were uninhibited children. The suggestion of a genetic contribution to the inhibited and uninhibited temperamental categories implies that the physiological processes associated with the psychological categories might also be related to the occurrence of selected physical symptoms.

Interviews with the mothers of the inhibited and uninhibited children revealed that the former were likely to have bouts of chronic constipation during infancy and early childhood. Because

one cause of chronic constipation is high sympathetic tone on the large intestine, this fact is in accord with other evidence indicating higher sympathetic tone in inhibited children -- especially larger pupillary dilations and heart rate accelerations to cognitive stress. Further, more inhibited than uninhibited children had skin allergies or asthma as infants. These Type I atopic allergies can be exacerbated by high levels of cortisol, which presumably lead indirectly to increases in immunoglobulin E and allergic reactions. As noted, inhibited children have chronically higher levels of cortisol than uninhibited children. Hence, the relation between an inhibited temperament and these allergies suggests that selected biological processes are influencing both the behaviors of interest and immune processes responsible for the allergic symptoms (Bazoral et al., 1974; Shipley, 1985). For these reasons we decided to interview the first and second degree relatives of these two groups of children to see if these and related symptoms were more frequent among the relatives of inhibited compared with uninhibited children.

II. Specific Aims

The objective of the project was to assess the differential frequency of a set of physical and psychological symptoms in the first and second degree relatives (parents, grandparents, aunts, and uncles) of inhibited and uninhibited children with special attention to allergies and symptoms reflecting high sympathetic tone or activity in the pituitary-adrenal axis. In addition, we

wished to see if self reports of shyness and anxiety were more frequent among the adult relatives of inhibited than uninhibited children.

III. Methods

The evidence in this study came from a telephone interview which inquired about 63 physical symptoms and 16 psychological qualities related to shyness and anxiety. The interviews were conducted by four different interviewers, none of whom had any knowledge of the child who was related to the adult being interviewed. At the time of this report, we have interviewed 274 adults from 60 families comprising the two independent cohorts of children we selected at either 21 or 31 months of age to be inhibited or uninhibited. These adult relatives were living in 30 different states, all regions of the country, and some had never seen the child who was the target in our longitudinal study. Interview data have been checked and entered in the computer for 152 relatives of the inhibited children and 100 relatives of the uninhibited children and this report is based on these data. This sample comprises about 60 percent of the total sample to be interviewed across the approximately 85 families in the study. This interview appears as Appendix 1.

IV. Results

A. Main Sample

As might be expected, the frequency of occurrence of most of the symptoms was low (less than 10 percent for most symptoms) and there were no significant differences between the relatives of the

two temperamental groups for over 90 percent of the symptoms. However, as predicted and as Table 1 reveals, the occurrence of hayfever was significantly more frequent among the relatives of inhibited (32 percent) compared with uninhibited children (20 percent) ($p < .01$). The difference between the two temperamental groups was especially prominent for fathers (40 percent of the fathers of inhibited children but not one father of an uninhibited child reported hayfever). However, there were no significant differences between the two groups for skin, food, or medicine allergies nor for asthma. Although asthma and skin allergies did not differentiate the relatives of the two temperamental groups, there were interesting correlations among selected symptoms across all of the subjects. Hayfever and skin allergies were positively related as were asthma and headaches.

The specificity of the difference in the occurrence of hay fever is supported by recent work by Mary Jasnoski, Iris Bell, and the principal investigator. We recently compared extreme extroverts with introverts (the top and bottom five percent of a sample of 379 college students) with respect to a variety of allergies. Hayfever was the only allergic symptom to differentiate the two psychological groups with significantly more introverts than extroverts reporting hayfever (33 versus 0 percent). Pollen and dust were reported as the primary triggers for their rhinitis.

One of the many possible interpretations of this result is based on the fact that the olfactory system lacks a blood-brain

barrier and trace substances pass to and from the nasal mucosa and the limbic system and other structures in the brain (Shipley, 1985). Thus, the sensitivity of the olfactory epithelium can be influenced by neurotransmitters, hormones, and peptides in the central nervous system including norepinephrine which, in turn, is influenced by activity in the locus ceruleus (Guevara-Aguilar, et al., 1985). Because there is reason to believe that inhibited children secrete more central norepinephrine, it is possible that one consequence is an olfactory epithelium that is unusually sensitive to antigens like pollen, dust, animal fur, as well as chemical solvents in the air.

In addition to hayfever, significantly more relatives of inhibited children reported chronic constipation (14 versus 6 percent; $p < .05$), with grandmothers contributing to the difference in a major way (33 percent of the grandmothers of inhibited children versus 4 percent of the grandmothers of uninhibited children). Thus, the two symptoms that differentiated between the two groups of children when they were young -- respiratory allergy and constipation -- also differentiated these older relatives. It is of interest that ten percent of the relatives of inhibited children, but only three percent of uninhibited children, reported having three or more symptoms involving gastrointestinal function, respiratory or skin allergies, and headaches.

It is also of clinical interest to note that the three cases of leukemia, the two cases of epilepsy, the three cases of lung

cancer, and the six cases of rheumatic fever (across all subjects) occurred among the relatives of inhibited children. None of these symptoms occurred among the relatives of uninhibited children. It is not clear why these rare and serious diseases should occur only among the relatives of inhibited children.

The adults interviewed had no idea of the primary hypothesis of the study; hence, there is no possibility of a bias among the relatives of the inhibited children to report these particular symptoms. Further, if there were a bias to overreport all symptoms, we should have found differences for many more symptoms, not just the small number that differentiated the two temperamental groups.

Finally, the relatives of inhibited children reported higher levels of anxiety and shyness. We computed an aggregate score for questions 65, 66, 67, 69, 70, and 71 from the interview in Appendix 1. This score represented the subject's self report (on a 5 point scale) for degree of anxiety, shyness, fear and worry in adulthood as well as recall of fear and shyness during childhood and a perception of physiological reactions under conditions of social anxiety. This aggregate score was significantly higher for the relatives of inhibited (mean of 2.6) compared with the relatives of uninhibited children (mean of 2.3) ($t = 2.94$, $p < .01$). Further, the adults who reported high levels of shyness and fear were more likely to report asthma, headaches, and constipation. Thus, some of the same symptoms

that differentiated the inhibited and the uninhibited children also differentiated adults who varied in their self reports of shyness and anxiety.

B. Supplementary Sample

We are administering the same interview to the first and second degree relatives of an independent sample of children we are following in our laboratory in a study designed to discover the early signs of inhibited and uninhibited behavior. This group consists of 100 Caucasian infants born to intact middle class families who are seen in our laboratory at 2, 4, 9, 14, and 21 months of age. We have found that 4 month old infants who showed both high levels of motor arousal as well as fretting and crying to changes in visual and auditory information (about 30 percent of the sample) are much more likely to display shyness and fearful behavior in the second year of life than the infants who show very low levels of motor arousal and no fretting or crying to the same stimulus events. These differences in behavioral reactions to stimulation can be interpreted as reflecting variation in the thresholds of excitability in sites in the amygdala and their projections to the motor system and the hypothalamus. Thus, it is relevant to determine if the symptom profile in the adult relatives of these two groups of infants differ in a way that is similar to the profiles reported for the relatives of the inhibited and uninhibited children.

We have conducted 478 interviews with members of 56 of the 100 families. Fourteen of the infants (from these 56 families)

showed high levels of fear in the second year as well as high motor arousal and fretting at four months while fourteen infants showed the complementary pattern. Examination of the interview data for the relatives of these 28 children reveal differences that resemble those found for the main sample.

The relatives of the high motor arousal, high fear infants reported more respiratory allergies and migraine headaches than did the relatives of the low arousal, low fear group. In one analysis we compared those families where a majority of the members reported a large number of relevant symptoms (allergies, headaches, constipation, and gastrointestinal symptoms) with those families in which no adult reported any of these symptoms. Among the families where many members showed one or more of these selected symptoms, three-quarters of the infants were high arousal and high fretting at four months and showed fearful behavior in the second year. By contrast, in only one-quarter of the families reporting a low incidence of these symptoms were there infants who displayed high arousal and high fear.

V. Conclusions

These preliminary data analyses are in accord with the hypothesis of a genetic contribution to selected allergies and symptoms that are presumably linked to emotional distress (headaches, constipation, and gastrointestinal symptoms). The large difference in the occurrence of hayfever, combined with the assumption of a genetic contribution to this allergic symptom, suggests that a set of inherited processes mediates both the

behavioral and allergic profiles. We shall pursue these ideas as we gather the rest of our data.

VI. Literature Cited

Bazaral, M., Orgel, A.G., & Hamburger, R.N. (1974). Genetics of IgE. and allergy, The Journal of Allergy and Clinical Immunology, 54:288-304.

Guevara-Aguilar, R., Solano-Flores, L.P., Garcia-Diaz, D.E., & Aguilar-Baturoni, H.U., (1985). Effects of dopamine and norepinephrine on neuronal activity of the olfactory tubercle, Brain Research Bulletin, 15:665-668.

Kagan, J., (1989). Temperamental contributions to social behavior, American Psychologist, 44:668-664.

Kagan, J., Reznick, J.S., Clark, C., Snidman, N., Garcia-Coll, C. (1984). Behavioral inhibition to the unfamiliar, Child Development, 55:221-225.

Kagan, J., Reznick, J.S., & Snidman, N., (1987). Physiology and psychology of behavioral inhibition, Child Development, 58:1459-1473.

Kagan, J., Reznick, J.S., & Snidman, N., (1988). Biological bases of childhood shyness, Science, 240:167-171.

Plomin, R. & Rowe, D.C. (1979). Genetic and environmental etiology of social behavior in infancy, Developmental Psychology, 15:62-72.

Scarr, S. & Kidd, K.K. (1983). Developmental behavior genetics in M. M. Haith and J. J. Campos, (eds.), P.H. Mussen, (Series Editor) Handbook of Child Psychology, Vol. 2. Infancy and

Psychobiology, New York: Wiley.

Shipley, M.T., (1985). Transport of molecules from nose to brain, Brain Research Bulletin 15:129-142.

Table 1

Percent of the Relatives of Each Group Reporting Selected Symptoms

<u>Symptom</u>	<u>Relatives of Inhibiteds (N=152)</u>	<u>Relatives of Uninhibiteds (N=100)</u>
Hayfever *	32	20
Skin Allergies	19	19
Dermatitis	15	11
Food Allergies	19	11
Allergies to medicine	20	26
Asthma	10	9
Constipation *	14	6
Headaches	17	13
Intestinal distress (colitis, indigestion, gastritis)	19	16
Ulcers	6	7
Thyroid problems	8	6
Diabetes	5	6
Diseases of the reproductive tract	14	8
Rheumatic fever	4	0
High blood pressure	21	22
Heart attack	7	6
Heart murmur	13	9
Arthritis	24	26
Cancer of the GI tract	2	0

<u>Symptom</u>	<u>Relatives of Inhibiteds (N=152)</u>	<u>Relatives of Uninhibiteds (N=100)</u>
Skin cancer	8	4
Color blind	5	5
Loss of taste or smell	5	1
Self report of extreme anxiety *	10	4
Depression	14	13
Insomnia	18	14

*statistically significant difference

ONR INTERVIEW

Hello, I'm _____ and I am calling from the Harvard Infant Study. Your (relative) _____ has been a part of our studies on temperament. We have been studying children in two groups that have represented extremes in temperament, extremely inhibited or uninhibited, as well as differences in their patterns of illnesses. We have received a small grant from the government to interview the immediate relatives of these children to determine whether there is a biological contribution in relatives of these children. I would like to conduct a 40 minute phone interview about the presence or absence of a large number of medical symptoms as well as psychological problems. You will be paid \$10 for the interview. If now is not a convenient time for the interview I would like to set up an appointment so that I may call you at a more convenient time.

PLEASE WRITE CLEARLY.

Interviewer: _____ Date: _____

Name: _____ Sex: M F Age: _____

Child related to: Pearl Opal ~~Jaeger~~ S# _____

Child's Name: _____

Nature of relationship to child: (mat / pat) _____

Address: _____

_____ Dominance :

Phone: _____ - _____ - _____

R L

Height: _____ Weight: _____

circle one:

Hair color: Lt. Blond Blond Sandy Brown Black Red

Eye color: Lt. Blue Blue Gray Hazel Brown Green Black

Education: _____ Yrs. Degree(s): _____

Occupation: _____ If housewife, list previous occupation.

Ordinal position: _____ of _____

Was information given by: Self or Relative

SS#: _____ - _____ - _____ - _____

Have you ever had any of the following illnesses, disorders, or conditions?

1. Arthritis or any kind of rheumatism? N Y
Eg. Inflammation of joints

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

2. A bone cyst or spur? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

3. A slipped or ruptured disk? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

4. Repeated trouble with neck, back, or spine? N Y
What was the cause of this trouble?

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

5. Bursitis? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

6. A tumor, cyst or growth of the skin? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

7. Skin cancer? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

8. Deafness in one or both ears? N Y

If Y, a. Age of onset _____ b. Present now? N Y
 c. Severity 1 2 3 d. Under Dr.'s care? N Y
 e. Treatment?

9. Ringing in the ears? N Y

If Y, a. Age of onset _____ b. Present now? N Y
 c. Severity 1 2 3 d. Under Dr.'s care? N Y
 e. Treatment?

10. Blindness in one or both eyes? N Y

If Y, a. Age of onset _____ b. Present now? N Y
 c. Severity 1 2 3 d. Under Dr.'s care? N Y
 e. Treatment?

11. Cataracts? N Y

a. Age of onset _____ b. Present now? N Y
 c. Severity 1 2 3 d. Under Dr.'s care? N Y
 e. Treatment?

12. Glaucoma? N Y
 Eg. Pressure behind the eye

If Y, a. Age of onset _____ b. Present now? N Y
 c. Severity 1 2 3 d. Under Dr.'s care? N Y
 e. Treatment?

13. Color blindness? N Y

If Y, a. Age of onset _____ b. Present now? N Y
 c. Severity 1 2 3 d. Under Dr.'s care? N Y
 e. Treatment?

14. Loss of taste or smell which lasted 3 months or more? N Y

If Y, a. Age of onset _____ b. Present now? N Y
 c. Severity 1 2 3 d. Under Dr.'s care? N Y
 e. Treatment?

15. Paralysis of any kind? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 d. Under Dr.'s care? N Y
e. Treatment?

16. Gallstones? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 d. Under Dr.'s care? N Y
e. Treatment?

17. Jaundice? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 d. Under Dr.'s care? N Y
e. Treatment?

18. Ulcers? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 d. Under Dr.'s care? N Y
e. Treatment?

19. Hernia? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 d. Under Dr.'s care? N Y
e. Treatment?

20. Gastritis? N Y

Eg. Inflammation of the stomach lining; prolonged and frequent cramps

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 d. Under Dr.'s care? N Y
e. Treatment?

21. Frequent indigestion? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 d. Under Dr.'s care? N Y
e. Treatment?

22. Colitis? N Y
Eg. inflammation of the colon; painful colon

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

23. Frequent constipation? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

24. Any other bowel trouble? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

25. Cancer of the stomach, intestines, colon, or rectum? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

26. Lymphoma or leukemia? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

27. Breast cancer? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

28. Any thyroid trouble? N Y
Eg. Overactive - lots of energy; goiter
Underactive - lack of energy

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

29. Diabetes? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

30. Anemia? N Y

Eg. lack of red blood cells; fatigue, weakness

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

31. Epilepsy? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

32. Migraine headaches? N Y

Eg. Severe headaches on the top of the head

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

33. Frequent headaches? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

34. Any diseases of the genital organs? N Y

Eg. VD, gonorrhea, syphilis, AIDS, Herpes

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

35. Any diseases of the reproductive tract? N Y

For men: prostate.

For women: ovarian cysts, fibroids, PID, cervical infections.

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

For women only:

36. Any trouble with menstruation? N Y
Eg. amenorrhea, painful, prolonged cycle, or short cycle

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

37. Endometriosis? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

38. Cancer of the cervix, uterus, ovaries, or endometrial lining? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

39. Difficulties becoming pregnant? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

For Men only:

40. Prostate cancer? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

41. Rheumatic fever? N Y
Eg. Acute inflammation of joints and connective tissues

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

42. Rheumatic heart disease? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

43. Hardening of the arteries? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

44. Coronary heart disease? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

45. Hypertension or high blood pressure? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

46. Stroke? N Y

Eg. Cerebral hemorrhage, embolism, or thrombosis

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

47. Any other heart attack? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

48. Heart murmur? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

49. Hemorrhoids? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

50. Tumor growth on throat or larynx, whole bronchial tube, or lung? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

51. Lung cancer? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

52. Emphysema? N Y

Eg. Inflammation of lungs causing difficulty breathy in smokey areas or in hot weather

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

53. Any other medical symptoms involving respiration? N Y
Eg. Shortness of breath at high altitudes or at night

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

54. Fainting spells? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

The following questions are about allergies:

55. Eczema? N Y
Eg. Inflammation of the skin; rash-like

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

56. Any kind of skin allergy, like hives? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

57. Dermatitis or any other skin trouble? N Y
Eg. Poison Ivy, Poison Oak

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

58. Any food allergies? N Y

What kinds of foods?

What are the symptoms?

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

59. Any allergies to medicines? N Y

What medicines?

What are the symptoms?

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

60. Any other allergies? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

61. Asthma? N Y

If Y, a. Age of onset _____ b. Present now? N Y
 c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
 e. Treatment?

62. Hay fever? N Y

If Y, a. Age of onset _____ b. Present now? N Y
 c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
 e. Treatment?

63. Sinus trouble? N Y

Eg. Sinusitis, inflammation of sinuses, pain in sinuses

If Y, a. Age of onset _____ b. Present now? N Y
 c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
 e. Treatment?

For any person admitting to asthma, hay fever, or any skin allergies, the following additional questions will be asked:

1. Has the allergy been diagnosed by a doctor? N Y
2. How many attacks of the symptom(s) have you had in the last 12 months?
3. Do these symptoms usually occur in the spring, fall, winter, or summer?
4. During the past year, has a doctor prescribed any treatment for any of these symptoms? N Y
 If Y, treatment?
5. During the past year has the symptom(s) required you to stay in bed for all or most of the day? N Y
6. Have you received any shots to prevent hay fever or other plant allergies? N Y
7. What allergies did you have during the first 20 years of your life but do not have now?

For the following questions check one of the points representing the subject's best answer to the question.

64. Do you feel shy with strangers?

Never___ Rarely___ Occasionally___ Usually___ Frequently___

65. Do you like parties that have many people?

Never___ Rarely___ Occasionally___ Usually___ Frequently___

66. Do you experience fear, anxiety, or worry?

Never___ Rarely___ Occasionally___ Usually___ Frequently___

67. Do you experience depression?

Never___ Rarely___ Occasionally___ Usually___ Frequently___

68. From 3-10 years of age, were you shy with other children?

Never___ Rarely___ Occasionally___ Usually___ Frequently___

69. From 5-10 years of age, were you afraid of going to school?

Never___ Rarely___ Occasionally___ Usually___ Frequently___

70. Do you experience "butterflies in the stomach" or heart pounding or "blushing" when you feel shy with a stranger or group of unfamiliar people?

Never___ Rarely___ Occasionally___ Usually___ Frequently___

71. Have you seen a professional and been diagnosed as having panic or agoraphobia? N Y Age diagnosed:_____

72. Have you seen a professional and been diagnosed as having anxiety disorder? N Y Age diagnosed:_____

73. Have you seen a professional and been diagnosed as having depression? N Y Age diagnosed:_____

74. Have you seen a professional and been diagnosed as having anorexia? N Y Age diagnosed: _____

75. Have you seen a professional and been diagnosed as having bulimia? N Y Age diagnosed: _____

76. Have you seen a professional and been diagnosed as having alcoholism? N Y Age diagnosed: _____

77. Have you ever had any form of a serious mental illness? N Y
Eg. Schizophrenia, mania, depression

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

78. Serious mental illness requiring hospitalization? N Y

Type of mental illness?

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

79. Insomnia or chronic difficulty sleeping? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

80. Appendicitis? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?

81. Any other illnesses or hospitalizations not covered by the previous questions? N Y

If Y, a. Age of onset _____ b. Present now? N Y
c. Severity 1 2 3 _____ d. Under Dr.'s care? N Y
e. Treatment?